Name: Suggested solution_ **Class:**_____

Level 1-2 – Simple questions

1. Simplify the following expressions.

(a) $2x + 3x + 4x$

$2x + 3x + 4x = \underline{\underline{9x}}$

(b) $3y - 8y + 2y$

$3y - 8y + 2y = -5y + 2y$

$= \underline{\underline{-3y}}$

2. Simplify the following expressions.

(a) $3x - y + 6x + 7y$

$3x - y + 6x + 7y = 3x + 6x - y + 7y$

$= \underline{\underline{9x + 6y}}$

(b) $x - 8y - 6 + 10y - 5x + 3$

$x - 8y - 6 + 10y - 5x + 3 = x - 5x - 8y + 10y - 6 + 3$

$= \underline{\underline{-4x + 2y - 3}}$

3. Solve the following equations.

(a) $2x - 5 = 11$

$2x - 5 = 11$

$2x = 11 + 5$

$2x = 16$

$x = \frac{16}{2}$

$= \underline{\underline{8}}$

(b) $3x + 7 = 1$

$3x + 7 = 1$

$3x = 1 - 7$

$3x = -6$

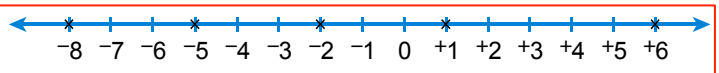
$x = \frac{-6}{3}$

$= \underline{\underline{-2}}$

4. Arrange the following numbers in ascending order.

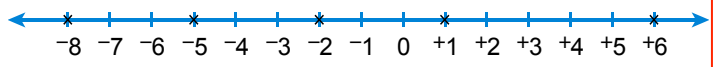
(a) $-8, -5, 6, -2, 1$ **(b)** $-2, 5, -1, 0, -\frac{1}{2}, 9$

a)



$\therefore \underline{\underline{-8 < -5 < -2 < 1 < 6}}$

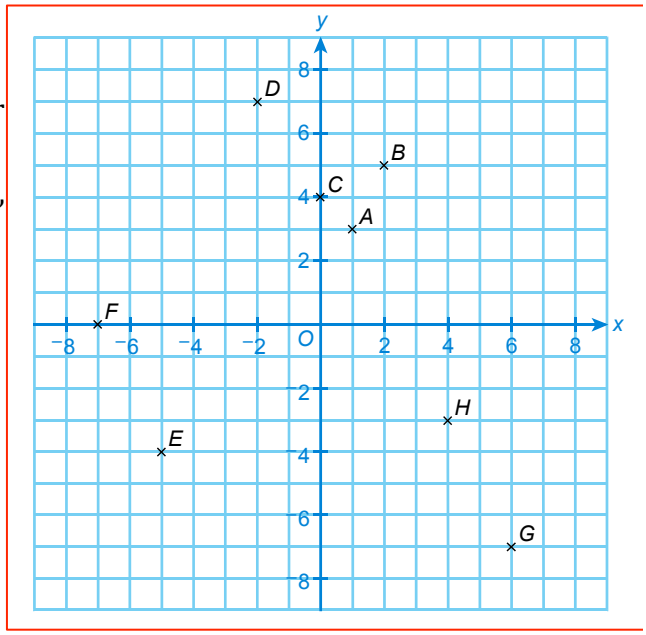
b)



$\therefore \underline{\underline{-2 < -1 < -\frac{1}{2} < 0 < 5 < 9}}$

5. Mark the following points on the rectangular coordinate plane.

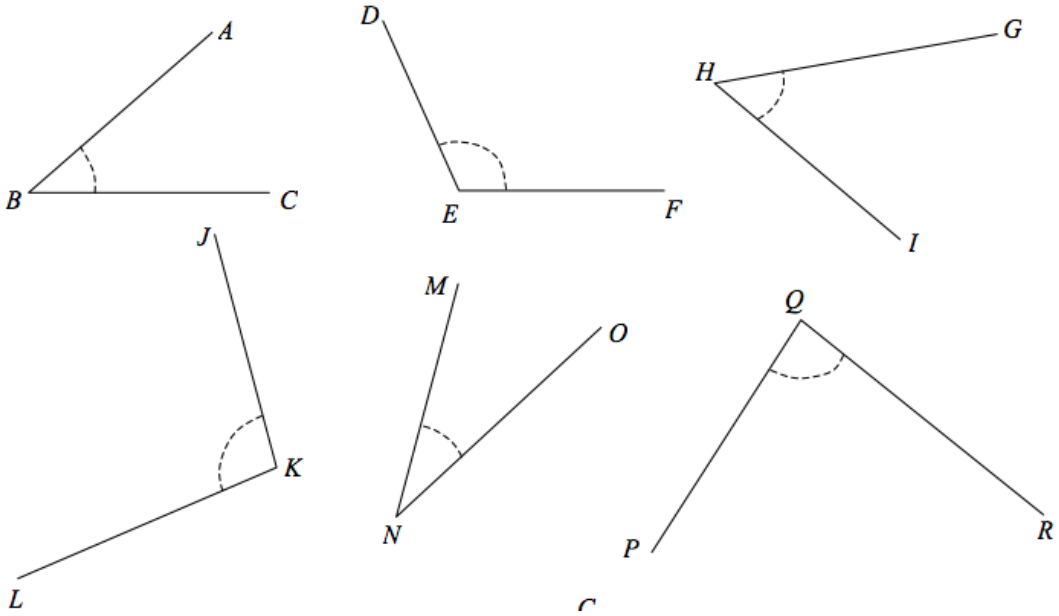
$A(1, 3)$, $B(2, 5)$, $C(0, 4)$, $D(-2, 7)$, $E(-5, -4)$, $F(-7, 0)$, $G(6, -7)$, $H(4, -3)$



6. Given that $y = 3x - 5$, complete the following table.

x	−3	−2	−1	0	1	2
y	−14	−11	−8	−5	−2	1

7. Measure the following angles:



$\angle ABC = 40°$

$\angle DEF = 115°$

$\angle GHI = 50°$

$\angle JKL = 80°$

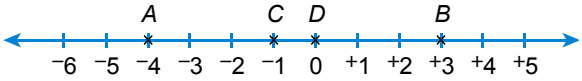
$\angle MNO = 152°$

$\angle PQR = 85°$

8. Simplify $12 : 20$.

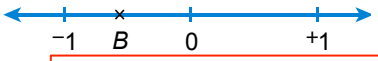
$$12 : 20 = \frac{12}{20}$$
$$= \frac{3}{5}$$
$$= \underline{\underline{3 : 5}}$$

9. According to the number line below, find the values of points A to D.



$A = -4,\ B = +3,\ C = -1,\ D = 0$

10. Find in the box with suitable symbols. (> or <)



(a) $-1 < 1$
(b) $0 > -1$
(c) $0 > B$
(d) $B > -1$

11. Find the distance between each of the following pairs of A and B.

(a) $A(0, 1), B(0, 9)$	**(b)** $A(-2, 0), B(3, 0)$	**(c)** $A(4, 5), B(-2, 5)$
$AB = (9 - 1)$ units AB $= 8$ units	AB $= [3 - (-2)]$ units AB $= (3 + 2)$ units	AB $= [4 - (-2)]$ units $= (4 + 2)$ units $= 6$ units

Level 3-4 – More Complex Questions

12. Simplify $\frac{3}{2} : \frac{12}{7}$.

$$\frac{3}{2} : \frac{12}{7} = \frac{\frac{3}{2}}{\frac{12}{7}}$$
$$= \frac{3}{2} \times \frac{7}{12}$$
$$= \frac{7}{8}$$
$$= \underline{\underline{7 : 8}}$$

13. The following table shows the scores of S2C students in a Mathematics quiz (full score is 20).

Score	Frequency
1 - 5	3
6 - 10	7
11 - 15	18
16 - 20	12

(a) Find the second class interval. (6-10)
(b) Find the upper class limit of the first class interval. (5)
(c) How many students have scores less than 5.5? (3 students)
(d) Find the lower class limit of the third class interval. (11)
(e) How many students are there in S2C? (3+7+18+12=40)

14. Mary and Gilbert have \$1 500 in total. If Mary has \$8x, express the amount got by Gilbert by using an algebraic expression.

Amount got by Gilbert $= \underline{\$(1\,500 - 8x)}$

15. The number of stickers Anna got is 3 times that of Ada's. They have 164 stickers in total. How many stickers does Ada have?

Let x be the number of stickers Ada got.

$$x + 3x = 164$$
$$4x = 164$$
$$x = \frac{164}{4}$$
$$= 41$$
$\therefore$ Ada has 41 stickers.

16. Given that $x = 5 - 4y$, complete the following table.

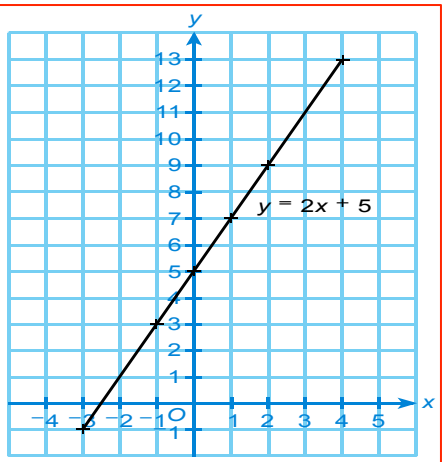
x	17	13	9	5	1	-3	-7
y	−3	−2	−1	0	1	2	3

17.

(a) Given that $y = 2x + 5$, complete the following table.

x	−3	−1	0	1	2	4
y	-1	3	5	7	9	13

(b) Draw the graph of $y = 2x + 5$ from $x = -3$ to $x = 4$ on a rectangular coordinate plane.



18. If the graph of $y = 8x - 4$ cuts the x-axis and the y-axis at points A and B respectively, find the coordinates of A and B.

Let $(a, 0)$ be the coordinates of A and $(0, b)$ be the coordinates of B.
Substitute $x = a$ and $y = 0$ into the equation,

$0 = 8a - 4$

$4 = 8a$

$a = \frac{1}{2}$

Substitute $x = 0$ and $y = b$ into the equation,

$b = 8(0) - 4$

$= -4$

$\therefore$ The coordinates of A are $(\frac{1}{2}, 0)$ and the coordinates of B are $(0, -4)$.

19. The ratio of the selling prices of two computers is 2 : 3. If the selling price of the less expensive computer is \$8 400, find the selling price of the more expensive one.

Let \$$x$ be the selling price of the more expensive computer.

$8\,400 : x = 2 : 3$

$\frac{8\,400}{x} = \frac{2}{3}$

$8\,400 \times 3 = 2x$

$2x = 25\,200$

$x = \frac{25\,200}{2}$

$= 12\,600$

The selling price of the more expensive one is \$12600.

20. A car travels 810 km in 9 hours, while a train travels 576 km in 6 hours. Which vehicle has a higher speed?

$$\text{Speed of the car} = \frac{810 \text{ km}}{9 \text{ h}}$$
$$= 90 \text{ km/h}$$
$$\text{Speed of the train} = \frac{576 \text{ km}}{6 \text{ h}}$$
$$= 96 \text{ km/h}$$

$\therefore$ The train has a higher speed.

21. If $x = -4$, find the values of the following expressions.

(a) $x^2 - 6$

$$x^2 - 6 = (-4)^2 - 6$$
$$= 16 - 6$$
$$= \underline{\underline{10}}$$

(b) $\dfrac{3x + 7}{x}$

$$\frac{3x + 7}{x} = \frac{3(-4) + 7}{-4}$$
$$= \frac{-12 + 7}{-4}$$
$$= \underline{\underline{\frac{5}{4}}}$$

22. Solve the equation $\frac{x}{2} - 3 = 10$.

$$\frac{x}{2} - 3 = 10$$
$$\frac{x}{2} = 10 + 3$$
$$\frac{x}{2} = 13$$
$$x = 13 \times 2$$
$$= \underline{\underline{26}}$$

23. Solve the equation $\frac{4}{5}x - 8 = \frac{1}{2}$.

$$\frac{4}{5}x - 8 = \frac{1}{2}$$
$$\frac{4}{5}x = \frac{1}{2} + 8$$
$$\frac{4}{5}x = \frac{17}{2}$$
$$x = \frac{17}{2} \times \frac{5}{4}$$
$$= \underline{\underline{\frac{85}{8}}}$$

24. Solve the equation $7 - 3x = 4x + 21$.

$$\begin{aligned} 7 - 3x &= 4x + 21 \\ -3x - 4x &= 21 - 7 \\ -7x &= 14 \\ x &= \frac{14}{-7} \\ &= \underline{\underline{-2}} \end{aligned}$$

25. Simplify $1\,\text{km} : 25\,\text{cm}$.

$$\begin{aligned} 1\,\text{km} &= 1\,000\,\text{m} \\ &= 1\,000 \times 100\,\text{cm} \\ &= 100\,000\,\text{cm} \\ \therefore \quad 1\,\text{km} : 25\,\text{cm} &= 100\,000\,\text{cm} : 25\,\text{cm} \\ &= \frac{100\,000}{25} \\ &= 4\,000 \\ &= \underline{\underline{4\,000 : 1}} \end{aligned}$$

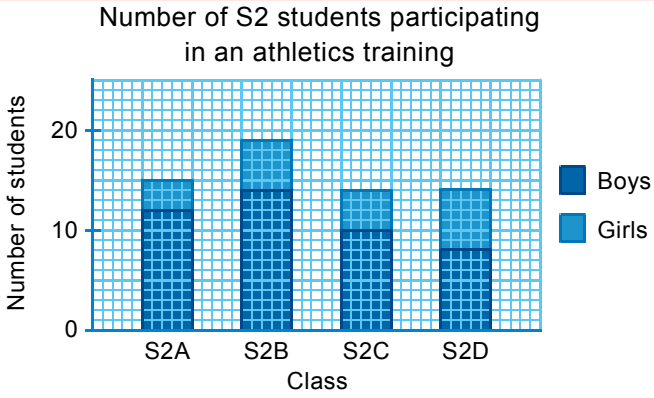
26. Simplify $\frac{5}{4} : \frac{7}{2}$.

$$\begin{aligned} \frac{5}{4} : \frac{7}{2} &= \frac{\frac{5}{4}}{\frac{7}{2}} \\ &= \frac{5}{4} \times \frac{2}{7} \\ &= \frac{5}{14} \\ &= \underline{\underline{5 : 14}} \end{aligned}$$

27. Simplify $0.24 : 3.6 : 0.48$.

$$\begin{aligned} 0.24 : 3.6 : 0.48 &= 0.24 \times 100 : 3.6 \times 100 : 0.48 \times 100 \\ &= 24 : 360 : 48 \\ &= \frac{24}{24} : \frac{360}{24} : \frac{48}{24} \\ &= \underline{\underline{1 : 15 : 2}} \end{aligned}$$

28. The following compound bar chart shows the number of S2 students partipating in an athletics training.



(a) Which class has the largest number of students participating in the athletics training?
(S2B has the largest number of students participating in the athletics training.)

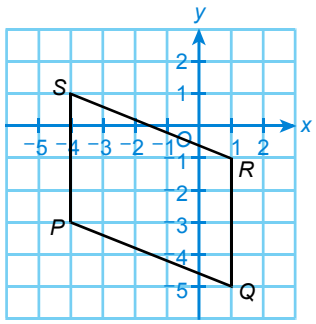
(b) How many students participate in the training in that class?
(There are 19 S2B students participating in the training.)

(c) How many of them are boys? (14 of them are boys.

(d) Which class has the largest number of girls participating in the athletics training?
(S2D as the largest number of girls participating in the athletics training.)

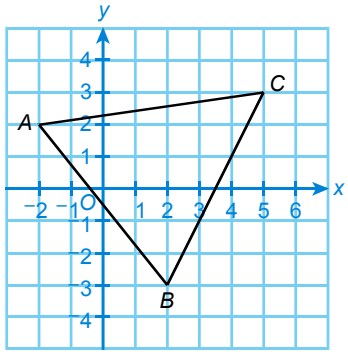
(e) How many girls participate in the training in that class?
There are 6 S2D girls participating in the training.

29. Find the area of parallelogram $PQRS$ in the figure.



The coordinates of M are $(1, -3)$.
$PS = [1 - (-3)]$ units
$= 4$ units
$PM = [1 - (-4)]$ units
$= 5$ units
$\therefore$ Area of parallelogram $PQRS = PS \times PM$
$= 4 \times 5$ square units
$= 20$ square units

30. Find the area of ΔABC in the figure.



Area of rectangle $CDEF = CD \times DE$
$= 7 \times 6$ square units
$= 42$ square units

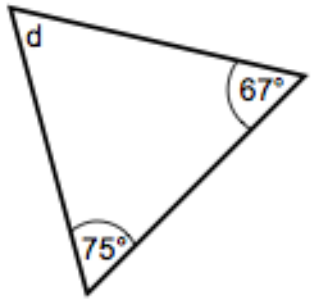
Area of $\Delta ACD = \frac{1}{2} \times AD \times CD$
$= \frac{1}{2} \times 7 \times 1$ square units
$= 3.5$ square units

Area of $\Delta ABE = \frac{1}{2} \times AE \times BE$
$= \frac{1}{2} \times 5 \times 4$ square units
$= 10$ square units

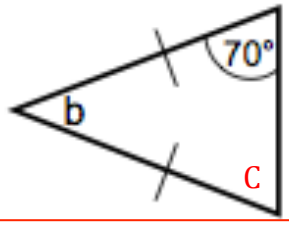
Area of $\Delta BCF = \frac{1}{2} \times BF \times CF$
$= \frac{1}{2} \times 3 \times 6$ square units
$= 9$ square units

$\therefore$ Area of ΔABC = Area of rectangle $CDEF$ – Area of ΔACD – Area of ΔABE – Area of ΔBCF
= (42 – 3.5 – 10 – 9) square units
= 19.5 square units

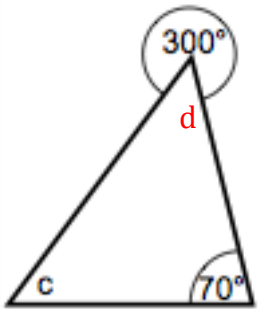
31. Work out the size of the angles marked with letters.



d+67+75=180
(∠ sum of △)
d=180-67-75
d=38°



c=70° (base ∠ of isos. △)
b+70+70=180(∠ sum of △)
b=180-140
b=40°



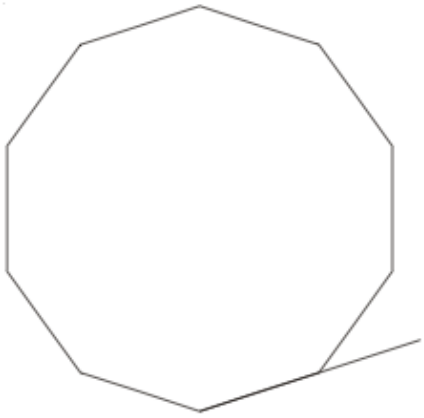
d+300=360 (∠ *at a pt*)
d=60°
d+c+70=180(∠ sum of △)
c=180-170-60
c=50°

32.

a) Name the regular polygon, ___Decagon ____.

b) Work out the size of an **exterior** angle and of an **interior** angle for this polygon.

a) Name the regular polygon, above. Decagon
b) Work out the size of an **exterior** angle and of an **interior** a
Exterior angle = 36° Interior angle = 144°
360 ÷ 10 180 - 36



33. Evaluate the following.

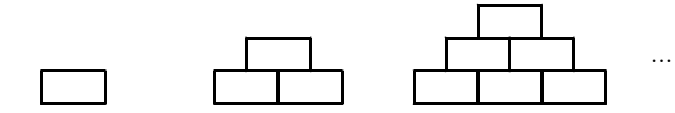
(a) $(-2)(5)+(-3)(-6)$

$(-2)(5)+(-3)(-6) = -10+18$
$= \underline{\underline{8}}$

(b) $(-12)\div(-4)-(-27)\div(-3)$

$(-12)\div(-4)-(-27)\div(-3) = 3-9$
$= \underline{\underline{-6}}$

34. The following is a sequence of figures.



The 1st figure The 2nd figure The 3rd figure ...

(a) Complete the following table.

Order of figures	1	2	3	4	5
Number of bricks	1	3	6	10	15

(b) What kind of sequence is formed by the number of bricks? **Triangular sequence.**

Level 5-6 – Challenging questions

35. If $p = -\frac{1}{2}$ and $q = 4$, find the values of the following expressions.

(a) $(q-1)(q+1)$ **(b)** $p^2 - 2pq + q^2$

$$(q-1)(q+1) = (4-1)(4+1)$$
$$= (3)(5)$$
$$= \underline{\underline{15}}$$

$$p^2 - 2pq + q^2 = (-\frac{1}{2})^2 - 2(-\frac{1}{2})(4) + 4^2$$
$$= \frac{1}{4} + 4 + 16$$
$$= \underline{\underline{20\frac{1}{4}}}$$

36. It is given that $T = (x^2y - 60)(1 + 2xy^n)$. If $x = 3$, $y = 4$ and $n = 2$, find the value of T.

$$T = (x^2y - 60)(1 + 2xy^n)$$
$$= [3^2(4) - 60][1 + 2(3)(4)^2]$$
$$= [9(4) - 60][1 + 6(16)]$$
$$= (36 - 60)(1 + 96)$$
$$= (-24)(97)$$
$$= \underline{\underline{-2\,328}}$$

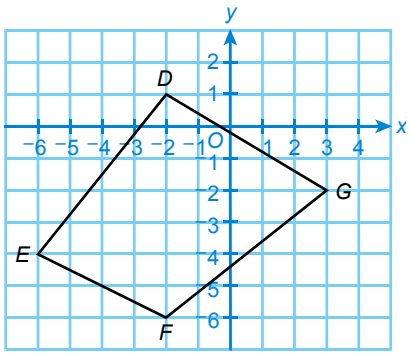
37. Solve the equation $\frac{y-7}{4} - 27 = -32$.

$$\frac{y-7}{4} - 27 = -32$$
$$\frac{y-7}{4} = -32 + 27$$
$$\frac{y-7}{4} = -5$$
$$y - 7 = -5 \times 4$$
$$y - 7 = -20$$
$$y = -20 + 7$$
$$= \underline{\underline{-13}}$$

38. Solve the equation $\frac{2y-5}{3} = -2$.

$$\frac{2y-5}{3} = -2$$
$$2y - 5 = -2 \times 3$$
$$2y - 5 = -6$$
$$2y = -6 + 5$$
$$2y = -1$$
$$y = \underline{\underline{-\frac{1}{2}}}$$

40. Find the area of quadrilateral $DEFG$ in the figure.



Area of $\Delta DEF = \frac{1}{2} \times EM \times DF$

$= \frac{1}{2} \times 4 \times 7$ square units

$= 14$ square units

Area of $\Delta DFG = \frac{1}{2} \times GN \times DF$

$= \frac{1}{2} \times 5 \times 7$ square units

$= 17.5$ square units

$\therefore$ Area of quadrilateral $DEFG$ = Area of ΔDEF + Area of ΔDFG

= (14 + 17.5) square units

= 31.5 square units

41. The following stem-and-leaf diagram shows the ratings of a government officer given by a group of people.

Ratings of a government officer given by a group of people

Stem (tens)	Leaf (units)
4	5 9
5	0 2 5 9
6	0 0 0 5 5 9
7	0 0 5 5 5
8	0 0 0 0 5
9	0 5 9

(a) How many people have given the government officer a rating of 70? (2 people)

(b) How many people have given ratings lower than 60? (2+4=6)

(c) What percentage of these people have given ratings higher than 80?)

Total number of people $= 2 + 4 + 6 + 5 + 5 + 3$

$= 25$

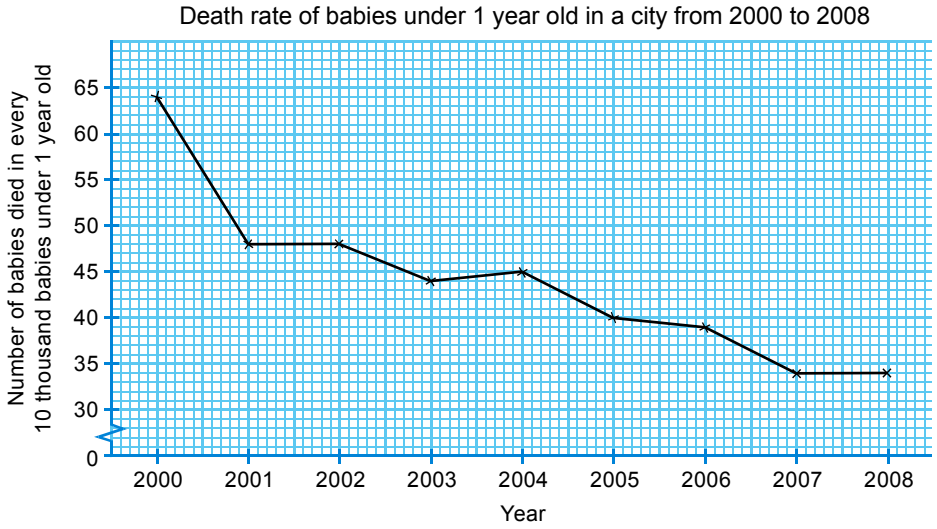
Number of people who have given ratings higher than 80 $= 1 + 3$

$= 4$

$\therefore$ Required percentage $= \frac{4}{25} \times 100\%$

$= \underline{\underline{16\%}}$

42. The following broken-line graph shows the death rate of babies under 1 year old in a city from 2000 to 2008, where the vertical axis shows the number of babies died in every 10 thousand babies under 1 year old.



(a) Write down the number of babies died in every 10 thousand babies under 1 year old in 2005. (40 babies)

(b) Describe the trend of the number of babies who died before 1 year old from 2000 to 2008. (Decreased gradually)

(c) Which of the following is the most possible number of babies died in every 10 thousand babies under 1 year old in 2009? Explain briefly.

(i) 50 **(ii)** 40 **(iii)** 30

According to the graph, it is predicted that the number of babies who died before 1 year old will keep decreasing. Thus, the most possible number of babies died in every 10 thousand babies under 1 year old in 2009 is 30.

43. The remaining values of the Octopus cards of Alice, Bonnie, Calvin and Derek are –$30, –$34, $0 and $33 respectively.

(a) Whose Octopus card has the highest remaining value? (Derek)

(b) Whose Octopus card has the lowest remaining value? (Bonnie)

(c) When the remaining value of the Octopus card is zero or negative, it cannot be used for payment. If these four people take the tram together, whose Octopus card cannot be used for paying the fare? (Alice, Bonnie and Calvin)

44. Write down an algebraic expression to represent the nth term of each sequence.

(a) 1, 4, 7, 10, ...

The 1st term $= 1 = 1 + 3 \times 0$

The 2nd term $= 4 = 1 + 3 = 1 + 3 \times 1$

The 3rd term $= 7 = 1 + 3 + 3 = 1 + 3 \times 2$

The 4th term $= 10 = 1 + 3 + 3 + 3 = 1 + 3 \times 3$

According to the above pattern,

the nth term $= 1 + 3 \times (n - 1)$

$= \underline{\underline{1 + 3(n - 1)}}$

(b) 5, 3, 1, –1, ...

The 1st term $= 5 = 5 - 2 \times 0$

The 2nd term $= 3 = 5 - 2 = 5 - 2 \times 1$

The 3rd term $= 1 = 5 - 2 - 2 = 5 - 2 \times 2$

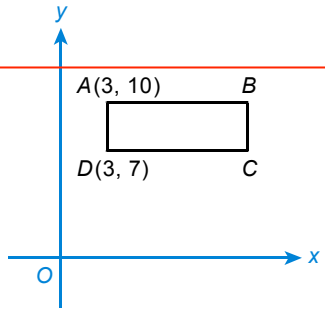
The 4th term $= -1 = 5 - 2 - 2 - 2 = 5 - 2 \times 3$

According to the above pattern,

the nth term $= 5 - 2 \times (n - 1)$

$= \underline{\underline{5 - 2(n - 1)}}$

45. The figure shows rectangle $ABCD$ where $AB = 3AD$.



(a) Find the length of AD. Hence find the length of AB.

$AD = (10 - 7)$ units $= 3$ units

$\because$ $AB = 3AD$

$\therefore$ $AB = 3 \times 3$ units $= 9$ units

(b) Find the perimeter of rectangle $ABCD$.

Perimeter of rectangle $ABCD$ $= 2 \times (3 + 9)$ units $= 24$ units

(c) Find the coordinates of B and C.

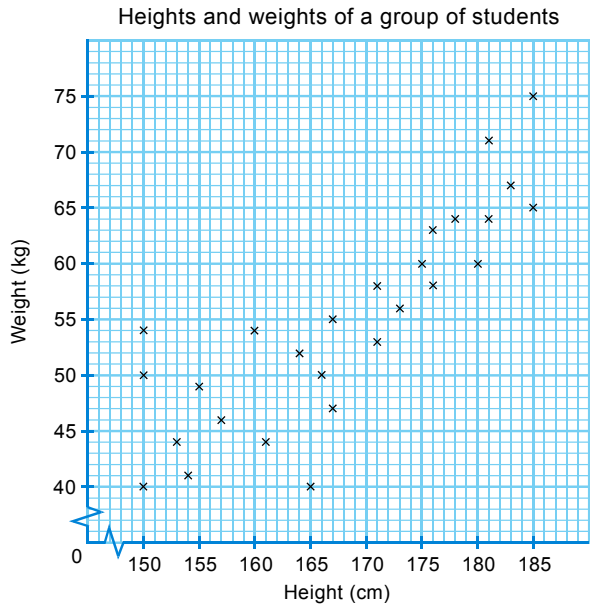
The coordinates of B are (12, 10), the coordinates of C are (12, 7).

46. (a) The following table shows the heights of S2B boys. Complete the table.

Height (cm)	Lower class boundary (cm)	Upper class boundary (cm)	Class mark (cm)	Frequency
150 - 154	149.5	154.5	152	4
155 - 159	154.5	159.5	157	7
160 - 164	159.5	164.5	162	6
165 - 169	164.5	169.5	167	3

(b) How many boys are there in S2B? (4+7+6+3=20)

47. The following scatter diagram shows the heights and weights of a group of students.



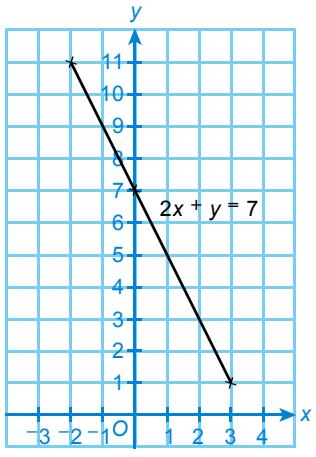
(a) Are the taller students heavier?
From the diagram, we can see that the taller the group of students are, the heavier they will be. There is a positive relation between their heights and weights.

(b) For the students with heights less than 170 cm, describe the relation between their heights and weights.
For the students with heights less than 170 cm, there is no obvious relation between their heights and weights.

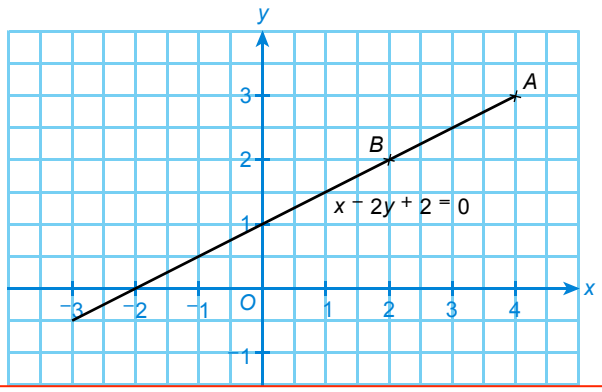
48. Draw the graph of $2x + y = 7$ from $x = -2$ to $x = 3$ on a rectangular coordinate plane.

$2x + y = 7$

x	−2	0	3
y	11	7	1



49. The following figure shows the graph of $x-2y+2=0$ from $x=-3$ to $x=4$.



(a) Write down the coordinates of points A and B. (A(4,3), B(2, 2)

(b) Write down the coordinates of the point at which the graph cuts

(i) the x-axis. (-2,0)

(ii) the y-axis. (0,1)

(c) Does (1, 1.5) satisfy the equation $x-2y+2=0$?

From the graph, (1, 1.5) lies on the graph of x-2y+2=0.
Therefore, (1, 1.5) satisfies the equation x-2y+2=0

50. Simplify $1.75:1\frac{2}{3}$.

$$\begin{aligned}1.75:1\frac{2}{3} &= \frac{175}{100}:\frac{5}{3}\\ &= \frac{\frac{175}{100}}{\frac{5}{3}}\\ &= \frac{175}{100}\times\frac{3}{5}\\ &= \frac{21}{20}\\ &= \underline{\underline{21:20}}\end{aligned}$$

51. Janice and Steven share the amount of \$1 200. If Janice's share is 3 times of Steven's,

(a) find the ratio of Janice's and Steven's share.

When \$1 200 is divided into $1+3=4$ equal portions, Janice gets 3 portions and Steven gets 1 portion.

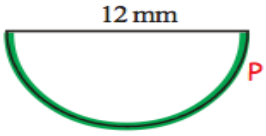
$\therefore$ Janice's share : Steven's share $= \underline{\underline{3:1}}$

(b) how much does Janice get?

$$\text{Janice's share} = \$1\,200\times\frac{3}{4}$$
$$= \underline{\underline{\$900}}$$

52. Work out the perimeter of the following shapes, taking π to be 3.14.

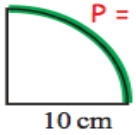
a)



Perimeter is green length plus 12 mm.

P = 30.84 mm

b)



P = 35.7 cm

Perimeter is green length plus 10 cm + 10 cm

53.

The sizes of the angles, in degrees, of the quadrilateral are

$x + 10$
$2x$
$x + 80$
$x + 30$

Angles of a quadrilateral add up to 360°
x + 80 + x + 10 + 2x + x + 30 = 360
5x + 120 = 360

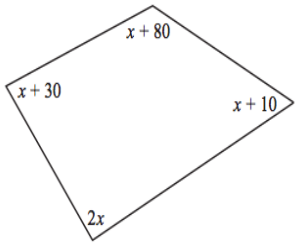


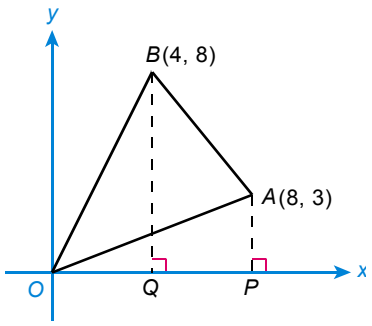
*Diagram **NOT** accurately drawn*

a) Use this information to write down an equation in terms of x. 5x + 120 = 360

b) Use your answer to part (a) to work out the size of the smallest angle of the quadrilateral. Smallest angle is 58°

5x + 120 = 360
5x = 240
x = 48

54. According to the figure below,



(a) find the area of ΔOBQ.

OQ = (4 – 0) units = 4 units
BQ = (8 – 0) units = 8 units

$\therefore$ Area of $\Delta OBQ = \frac{1}{2} \times OQ \times BQ$

$= \frac{1}{2} \times 4 \times 8$ square units

= 16 square units

(b) find the area of ΔOAP.

OP = (8 – 0) units = 8 units
AP = (3 – 0) units = 3 units

$\therefore$ Area of $\Delta OAP = \frac{1}{2} \times OP \times AP$

$= \frac{1}{2} \times 8 \times 3$ square units

= 12 square units

(c) find the area of trapezium $BAPQ$.

PQ = (8 – 4) units = 4 units

$\therefore$ Area of trapezium $BAPQ = \frac{1}{2} \times (AP + BQ) \times PQ$

$= \frac{1}{2} \times (3 + 8) \times 4$ square units

= 22 square units

(d) find the area of ΔOAB.

Area of ΔOAB = Area of ΔOBQ + Area of trapezium $BAPQ$ – Area of ΔOAP
= (16 + 22 – 12) square units
= 26 square units

55. Evaluate the following.

(a) $\dfrac{-2}{0+(-3)}$

$$\frac{-2}{0+(-3)} = \frac{-2}{-3}$$
$$= \underline{\underline{\frac{2}{3}}}$$

(b) $-[\dfrac{-2}{0+(-3)}]\times\dfrac{-9}{2}\div\dfrac{-3}{7}$

$$-[\frac{-2}{0+(-3)}]\times\frac{-9}{2}\div\frac{-3}{7} = -\frac{2}{3}\times(-\frac{9}{2})\div(-\frac{3}{7})$$
$$= -\frac{2}{3}\times(-\frac{9}{2})\times(-\frac{7}{3})$$
$$= \underline{\underline{-7}}$$

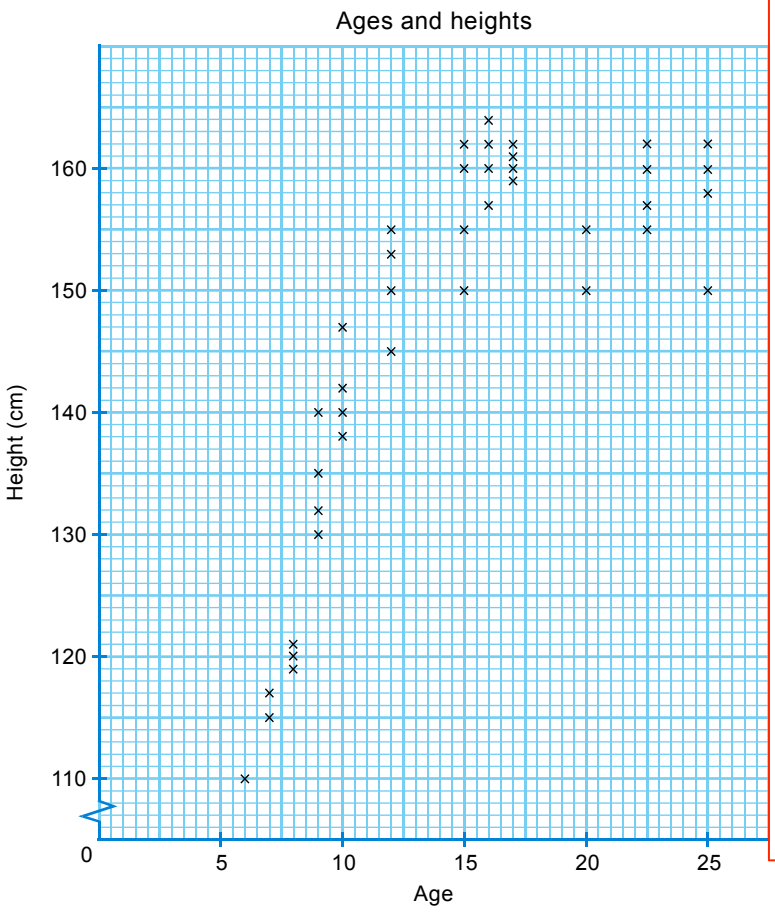
56. Solve the equation $\dfrac{7[4-3(2x-6)]}{3-(-2)} = 35$.

$$\frac{7[4-3(2x-6)]}{5} = 35$$
$$4-3(2x-6) = 35\times\frac{5}{7}$$
$$4-3(2x-6) = 25$$
$$-3(2x-6) = 25-4$$
$$-3(2x-6) = 21$$
$$2x-6 = \frac{21}{-3}$$
$$2x-6 = -7$$
$$2x = -7+6$$
$$2x = -1$$
$$x = \underline{\underline{-\frac{1}{2}}}$$

57. Solve the equation $\dfrac{2x-1}{6}+\dfrac{2x+1}{9}+\dfrac{x-4}{15} = \dfrac{5}{6}$.

$$\frac{2x-1}{6}+\frac{2x+1}{9}+\frac{x-4}{15} = \frac{5}{6}$$
$$90(\frac{2x-1}{6}+\frac{2x+1}{9}+\frac{x-4}{15}) = 90\times\frac{5}{6}$$
$$90(\frac{2x-1}{6})+90(\frac{2x+1}{9})+90(\frac{x-4}{15}) = 75$$
$$15(2x-1)+10(2x+1)+6(x-4) = 75$$
$$30x-15+20x+10+6x-24 = 75$$
$$56x-29 = 75$$
$$56x = 75+29$$
$$56x = 104$$
$$x = \frac{104}{56}$$
$$= \underline{\underline{\frac{13}{7}}}$$

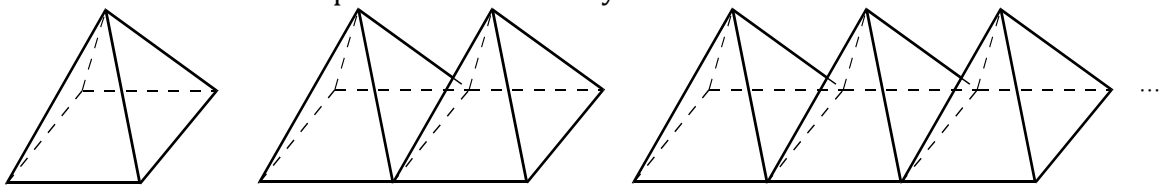
58. The following scatter diagram shows the ages and heights of a group of female interviewees.



(a) What are the ages of the eldest and the youngest interviewees?
(Eldest is 25 and youngest is 6)
(b) What is the age of the tallest interviewee?
(The tallest interviewee is 16)
(c) For the interviewees with ages below 15, what is the relation between their ages and heights?
(For the interviewees with ages below 15, the older they are, the taller they are. There is a positive relation between their ages and heights.)
(d) For the interviewees with ages above 15, what is the relation between their ages and heights?

(For the interviewees with ages above 15, there is no obvious relation between their ages and heights.)

59. Here is a series of patterns formed by sticks.



The 1st model The 2nd model The 3rd model

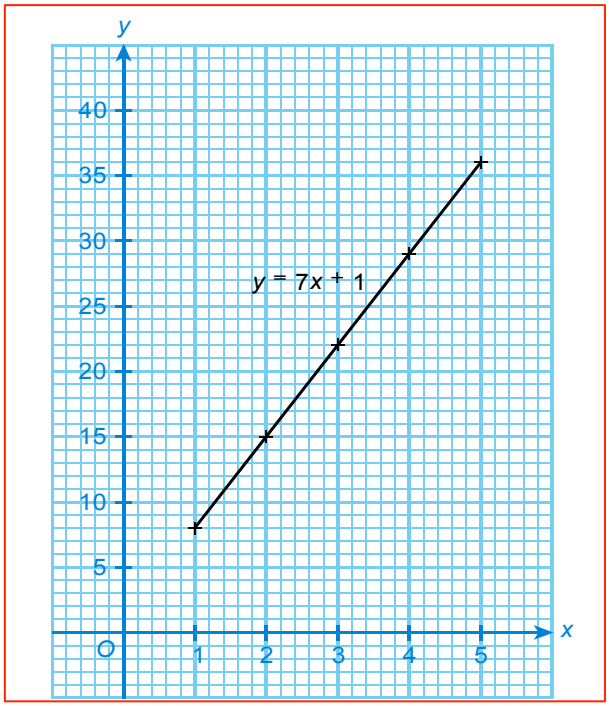
(a) According to the above pattern, complete the table below.

Order of models	1	2	3	4	5
Number of sticks	8	15	22	29	36

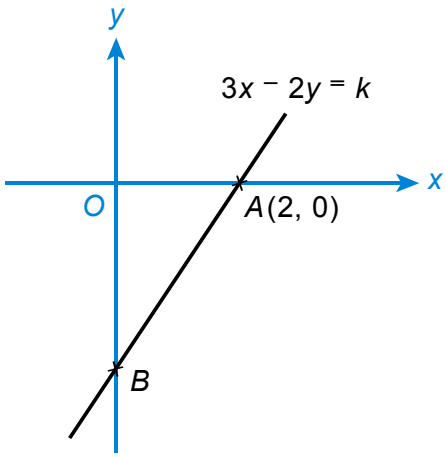
(b) Write an equation in x and y where y represents the number of sticks in the xth model.

$8 = 7 \times 1 + 1$
$15 = 7 \times 2 + 1$
$22 = 7 \times 3 + 1$
$29 = 7 \times 4 + 1$
$36 = 7 \times 5 + 1$
$\therefore$ The equation is $y = 7x + 1$.

(c) Draw the graph of the equation obtained in **(b)** from $x = 1$ to $x = 5$ on a rectangular coordinate plane.



60. In the figure, the graph of $3x - 2y = k$ passes through $A(2, 0)$ and cuts the y-axis at point B.



(a) Find the value of k.

$\because$ $A(2, 0)$ lies on the graph of $3x - 2y = k$.

$\therefore$ $(2, 0)$ satisfies the equation $3x - 2y = k$.

Substitute $x = 2$ and $y = 0$ into the equation,

$$3(2) - 2(0) = k$$
$$k = 6 - 0$$
$$= \underline{\underline{6}}$$

(b) Find the coordinates of B.

Substitute $x = 0$ into the equation,

$$3(0) - 2y = 6 \quad \text{(From the result of (a))}$$
$$0 - 2y = 6$$
$$y = \frac{6}{-2}$$
$$= -3$$

$\therefore$ The coordinates of B are $(0, -3)$.

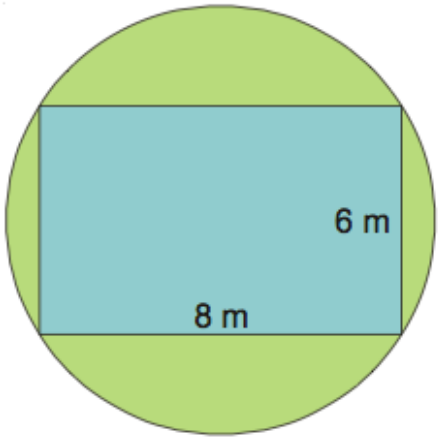
(c) Find the area of ΔAOB.

$OA = 2$ units

$OB = 3$ units

$$\therefore \text{ Area of } \Delta AOB = \frac{1}{2} \times OA \times OB$$
$$= \frac{1}{2} \times 2 \times 3 \text{ square units}$$
$$= 3 \text{ square units}$$

61. The diagram shows a circular garden comprising a rectangular pond enclosed by grass. The circular garden has a diameter of 10 m. The rectangular pond measures 8 m by 6 m. Work out the area of the garden covered in grass. Take π to be 3.14 and give your answer to the nearest m^2



31 m^2 to the nearest m^2

Circular garden area: $3.14 \times 5^2 = 78.5$

Rectangular pond area: $8 \times 6 = 48$

$78.5 - 48 = 30.5$

62. On a map with a scale of 1 : 500, the sides of a square pool are x each.

(a) Find the actual length of the pool in terms of x.

Actual length $= \underline{\underline{500x}}$

(b) Find the actual area of the pool in terms of x.

Actual area $= 500x \times 500x$

$= \underline{\underline{250\,000x^2}}$

(c) Find the ratio of the area of the pool on the map to its actual area.

Area on the map $= x^2$

$\therefore$ Area on the map : Actual area $= x^2 : 250\,000x^2$

$= \underline{\underline{1 : 250\,000}}$